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(54) Title: FIBROUS SHEET MATERIALS CONTAINING OAT EXTRACT (57) Abstract Fibrous sheet materials which incorporate oat extract provide a soothing effect to the skin of a user. In particular, the fibrous materials may be used for wet wipes. The wet wipes are at least partially saturated with an aqueous solution comprising oat extract which may reduce irritation and redness for users having sensitive skin. The oat extract may also be used on other fibrous materials intended for contact with the skin of the user such as facial tissue products and liner materials for absorbent articles such as diapers.		

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FIBROUS SHEET MATERIALS CONTAINING OAT EXTRACT

Background of the Invention

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Field of the Invention

The present invention relates to fibrous sheet materials which contain oat extract. The invention particularly concerns wet wipes which have been at least partially saturated with an aqueous solution which includes oat extract.

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Description of the Related Art

Wet wipes are well known commercial consumer products which have been available in many forms. Perhaps the most common form of wet wipes has been a stack of moistened sheets which have been packaged in a plastic container. The wet wipes have been made from a variety of materials which have been moistened with a variety of suitable aqueous wiping solutions. Such wet wipes have been used for baby wipes, hand wipes, household cleaning wipes, industrial wipes, personal hygiene wipes and the like.

20 However, the use of such wet wipes on sensitive skin has not been completely satisfactory. For example, the use of such wet wipes has not always led to a smoother, softer feel to the skin and at times has appeared to irritate and increase the redness of the skin and, in particular, very sensitive skin. Accordingly, it remains desirable to provide fibrous sheet materials and, in particular, wet wipes which have an improved
25 soothing effect on the skin.

Summary of the Invention

In response to the difficulties and problems discussed above, new fibrous sheet materials such as wet wipes which include an effective amount of oat extract to benefit sensitive
30 skin have been discovered.

In one aspect, the present invention provides a fibrous sheet material intended for contact with skin of a wearer which comprises an oat extract solution which includes oat extract and a solubilizing agent to provide a soothing effect to the skin. In a particular
35 aspect, the oat extract solution comprises from about 0.5 to about 50 weight percent of

oat extract and from about 10 to about 90 weight percent of the solubilizing agent based on a total weight of the solution and water.

5 In another aspect, the present invention provides a wet wipe which includes an aqueous liquid which comprises an oat extract solution, a preservative, and water. In a particular aspect, the wet wipe includes from about 150 to about 600 weight percent of the aqueous liquid. The aqueous liquid includes from about 0.5 to about 10 weight percent of an aqueous oat extract solution which includes from about 0.5 to about 20 weight percent oat extract and from about 30 to about 60 weight percent of a solubilizing agent
10 based on a total weight of the solution; from about 0.1 to about 1.0 weight percent of a preservative; and water. The solution may also include from about 0.25 to about 5.0 weight of a surfactant to aid in skin cleansing.

15 In yet a further aspect, the present invention provides an absorbent article which comprises: a) a substantially liquid impermeable outer cover; a liquid permeable bodyside liner which is positioned in facing relation with the outer cover wherein the bodyside liner includes oat extract to provide a soothing effect to a wearer's skin; and c) an absorbent body located between the outer cover and the bodyside liner.

20 The present invention, in its various aspects, advantageously relates to fibrous sheet materials such as wet wipes which, when compared to conventional sheet materials and wet wipes, provide an improved soothing effect on the skin. In particular, the present invention provides a wet wipe which is impregnated with an aqueous solution comprising oat extract which functions to clean the skin while at the same time soothing the skin.
25 Such wet wipes are particularly useful on skin which is sensitive and may help reduce skin redness.

Detailed Description of the Invention

30 The present invention relates to fibrous sheet materials which include oat extract to provide a soothing effect to the skin. The fibrous sheet materials of the present invention can be used in a wet or partially saturated state for wet wipes such as baby wipes, hand wipes, face wipes, household wipes, industrial wipes, personal hygiene wipes and the like; or in a dry state for conventional facial tissue, bathroom tissue or towels. The
35 fibrous sheet materials may also be used as components in disposable absorbent articles

such as diapers, training pants, feminine care products, adult incontinence products, and the like. For example, the fibrous sheet material may be used as the bodyside liner in a diaper article to protect and soothe the skin of the infant.

5 Materials suitable for the fibrous sheet materials of the present invention are well known to those skilled in the art. The sheet materials can be made from any woven or nonwoven fibrous material. For example, the sheet material may include meltblown materials, coform materials, air-laid materials, wet-laid materials, bonded-carded web materials, hydroentangled materials and the like or combinations thereof. The sheet
10 material can also comprise synthetic or natural fibers or combinations thereof. The sheet material may have a basis weight of from about 5 to about 200 grams per square meter and desirably from about 40 to about 100 grams per square meter depending upon the intended end use.

15 The fibrous sheet materials of the different aspects of the present invention include oat extract. Oat derivatives such as colloidal oatmeal, hydrolysed oat protein and oat extract have been used in the cosmetics and pharmaceutical industries as a skin protectant which provides a smooth after feel. Specifically, the carbohydrates and protein in the oat derivatives have been known to function as a protectant to aid in enhancing the skin's
20 barrier properties and thereby soothing the skin. The lipids in the oat derivatives, such as the beta glucans, have also been known to function as an emollient to lubricate and soothe the skin. For example, colloidal oatmeal has been used for bar soaps, baths, lotions and poultices to benefit skin that has been damaged, irritated or distressed due to a wide variety of reasons. However, some of the oat derivatives, such as colloidal
25 oatmeal, are not soluble or stable in aqueous solutions and may leave a chalky or powder residue after topical use. Moreover, other oat derivatives, such as hydrolysed oat protein, undergo processes such as hydrogenation which may alter or adversely affect their properties. In particular, hydrolysed oat protein has been known to have a very strong odor which may adversely affect the consumers perceptions.

30 Applicants have discovered that oat extracts are particularly desirable for use in fibrous sheet materials intended for personal use because they are typically readily soluble in the presence of certain solubilizing agents, relatively stable in aqueous solutions and relatively free of any malodor compared to other oat derivatives. For example, the oat
35 extract used in the different aspects of the present invention is desirably a water-soluble

oat extract such as an extraction of water, alcohols, glycerols, sorbitol, glycols, surfactants and the like and mixtures and combinations thereof.

5 Oat extracts for use in the present invention generally can be made by treating oats with extraction agents by methods known to those skilled in the art. Useful extraction agents may include water, alcohols, glycols, mineral oil, hydrocarbons, silicones, fatty acids, fatty acid derivatives, waxes, ethers, esters, and mixtures thereof.

10 The oat extract may be applied to the fibrous sheet material in a variety of forms depending upon the intended use of the material. Desirably, the oat extract is solubilized in a solution and the oat extract solution is applied to the sheet material to provide an even distribution of the oat extract on the material and to better impregnate the material. The oat extract solution may be applied to the fibrous sheet material by any conventional means, such as dipping, spraying, printing, brush coating or the like. Depending upon
15 the intended end use of the fibrous sheet material, the oat extract solution may be allowed to dry before the material is used. Alternatively, the oat extract may be applied to the fibrous sheet material in a substantially dry state or in an encapsulated state. The oat extract may otherwise be impregnated into a porous or microporous carrier material which is attached to the fibrous sheet material.

20 The oat extract may be applied to the entire sheet material or may be selectively applied to particular sections of the sheet material depending upon the intended end use. For example, if the sheet material is intended for use as a bodyside liner in an absorbent article, the oat extract solution may be applied to the central region of the article where
25 most of the irritation on the skin of the wearer occurs. Alternatively, if the sheet material is intended for use as a wet wipe, the sheet material may be at least partially saturated with the oat extract solution. The oat extract solution may otherwise be applied to the fibrous sheet material at the point of use.

30 The oat extract solution of the present invention includes an effective amount of oat extract which is solubilized in a solubilizing agent. The solubilized oat extract may then be further diluted in another liquid such as water. The oat extract solution may also include emollients, moisturizers, surfactants, preservatives, chelating agents, fragrances, pH buffers or combinations thereof. Suitable surfactants include anionic surfactants such
35 as acyl glutamates and acyl isethionates, alkanolamids, amphoteric surfactants and the

like. For example, a suitable acyl glutamate anionic surfactant is potassium cocyl glutamate and a suitable acyl isethionate anionic surfactant is ammonium cocyl isethionate. A suitable amphoteric surfactant is disodium capryloamphdipropionate.

5 As discussed above, the oat extract is particularly useful in the present invention due to its solubility and stability in an aqueous environment. This allows the oat extract to be used in a variety of products in which other oat derivatives, such as colloidal oatmeal, which are unstable in an aqueous environment would not be suitable or aesthetically desirable. This is particularly true in wet wipe products. The oat extract solution may
10 include an effective amount of oat extract which is capable of providing a soothing effect to the skin of the wearer in the particular product application. For example, the oat extract solution may include from about 0.5 to about 50 weight percent and desirably from about 0.5 to about 20 weight percent of oat extract based on a total weight of the solution.

15 The solubilizing agent in the oat extract solution may be any agent which effectively solubilizes the oat extract and which provides a solution which remains stable. For example, the solubilizing agent may be butylene glycol, propylene glycol, dipropylene glycols, glycerols, aqueous sorbitols and the like. Desirably, the solubilizing agent is not
20 irritating to the skin of the wearer. In particular, applicants have discovered that glycerin effectively solubilizes the oat extract while being relatively non-irritating to the skin of the user. If it is desirable to use a glycol as the solubilizing agent, butylene glycol is particularly desirable when compared to propylene glycol because it is less irritating to the skin of many users. Alternatively, the solubilizing agent may include a surfactant,
25 emulsifier or other solubilizing ingredient to avoid using propylene or butylene glycol. The oat extract solution may include any amount of solubilizing agent which is capable of solubilizing the oat extract. For example, the oat extract solution may include from about 10 to about 90 weight percent and desirably from about 30 to about 60 weight percent of the solubilizing agent based on a total weight of the solution.

30 A suitable oat extract solution for use in the different aspects of the present invention includes about 10 weight percent oat extract, about 45 weight percent 1,3 butylene glycol and about 45 weight percent water based on a total weight of the solution. Such a solution is available under the trade designation OSTAR™ ARRIVEEN BG-25 from
35 Canamino, Incorporated, a business having offices in Saskatoon, Canada.

The oat extract solution may be applied to the fibrous sheet material in any amount which provides the desired protection of and soothing effect to the skin of the user in the particular product application. For example, the oat extract solution may be added to the fibrous sheet material at an add-on level of from about 0.1 to about 50 weight percent and desirably from about 0.5 to about 20 weight percent based on a dry weight of the fibrous sheet material. The oat extract solution may also be incorporated into another liquid before being applied to the fibrous sheet material.

- 10 In a particular embodiment of the present invention, the fibrous sheet material of the present invention is used to provide a wet wipe such as a baby wipe. Such wet wipes are well known to those skilled in the art and generally include sheets of material which are at least partially saturated with an aqueous liquid. As discussed above, oat extract is particularly well suited for use in baby wipes because it can be provided in an aqueous environment which is generally stable. Moreover, the use of wet wipes as a means of transferring oat extract to the skin is a particularly effective means compared to using a lotion or other type of cosmetic application. Typically, wet wipes may be used at a frequency of from about 5-10 times per day on a diaper wearing infant while cosmetic applications, such as lotions, are typically used at a frequency of 1-2 times per day.
- 20 Thus, the use of wet wipes to transfer the oat extract to the skin results in a higher frequency of application which may more effectively impart a soothing effect on the skin.

The wet wipe may comprise any material described above as being useful for the fibrous sheet material of the present invention. For example, the sheet material for the wet wipe may comprise a coform basesheet of polymeric microfibers and cellulosic fibers having a basis weight of from about 60 to about 85, desirably from about 60 to about 80 grams per square meter, and desirably from about 75 to about 80 grams per square meter. Such coform basesheets are manufactured generally as described in U.S. Patent No. 4,100,324 to Anderson et al. which issued July 11, 1978, and which is herein incorporated by reference.

Typically, such coform basesheets comprise a gas-formed matrix of thermoplastic polymeric meltblown microfibers, such as, for example, polypropylene microfibers, and cellulosic fibers, such as, for example, wood pulp fibers. The relative percentages of the

polymeric microfibers and cellulosic fibers in the coform basesheet can vary over a wide range depending on the desired characteristics of the wet wipes. For example, the coform basesheet may comprise from about 20 to about 100 weight percent, desirably from about 20 to about 60 weight percent, and more desirably from about 30 to about 50 weight percent of polymeric microfibers based on the dry weight of the coform basesheet being used to provide the wet wipes. In a particular aspect, the coform basesheet includes an inner coform layer of polypropylene microfibers and cellulosic fibers positioned between two outer coform layers of linear low density polyethylene microfibers and cellulosic fibers. In such a configuration, the outer layers advantageously provide a soft outer surface while the inner layer provides strength to the coform basesheet. Such coform basesheets have been found to provide wet wipes having improved softness and cleaning properties compared to other sheet materials. Alternatively, the wet wipes can be made from a meltblown sheet of polymeric microfibers having a basis weight of from about 25 to about 120 grams per square meter.

The individual wet wipes contain an aqueous liquid which is absorbed into the wet wipes. The aqueous liquid contains the oat extract solution of the present invention to protect and impart a soothing effect to the skin of the wearer as the wet wipes are used to repeatedly clean the skin. The aqueous liquid contained within the wet wipes may also include any suitable components which provide the desired wiping properties. For example, the components may include emollients, moisturizers, fragrances, surfactants, preservatives, chelating agents, pH buffers or combinations thereof.

The aqueous liquid may include any amount of the oat extract solution which provides the desired effect to the skin. For example, the aqueous liquid may include from about 0.5 to about 10 weight percent and desirably from about 1.0 to about 3.0 weight percent of the oat extract solution based on the total weight of the aqueous liquid. In a particular aspect, the aqueous liquid includes about 1.5 weight percent of an oat extract solution which includes about 10 weight percent oat extract, about 45 weight percent butylene glycol and about 45 weight percent water based on a total weight of the solution. If the amount of oat extract solution in the liquid is less than the above-identified range, the wet wipe may not impart the desired soothing effect to the skin of the wearer.

The preservatives in the aqueous liquid may include any preservatives known to those skilled in the art which effectively inhibit the growth of microorganisms. For example, the

preservative may include parabens, sodium hydroxymethylglycinate, organic acids such as benzoic acid, DMDM hydantoin, DMDM hydantoin and iodopropynyl butyl carbamate, imidazolidinyl urea, 2-bromo-2-nitropropane-1,3-diol, phenoxyethanol and the like or any combinations thereof. A suitable preservative is sodium hydroxymethylglycinate which is commercially available from Sutton Laboratories under the trade designation

5 SUTTOCID A. The aqueous liquid may include any amount of preservative which provides the desired effect. For example, the aqueous liquid may include from about 0.1 to about 1.0 weight percent of the preservative based on the total weight of the aqueous liquid.

10 The aqueous liquid may further include a surfactant at an add-on of from about 0.1 to about 5 weight percent and desirably from about 0.5 to about 1.0 weight percent based on the total weight of the liquid. Such surfactants provide improved skin cleansing to the wet wipe. A particularly suitable surfactant includes Coco Phosphatidyl PG-Dimonium

15 Chloride which is commercially available from Mona Industries under the trade designation PHOSPHOLIPID CDM.

The amount of liquid contained within each wet wipe may vary depending upon the type of material being used to provide the wet wipe, the type of liquid being used, the type of

20 container being used to store the wet wipes, and the intended end use of the wet wipe. Generally, each wet wipe can contain from about 150 to about 600 weight percent and desirably from about 250 to about 450 weight percent liquid based on the dry weight of the wipe for improved wiping. In a particular aspect wherein the wet wipe is made from a coform material comprising from about 30 to about 40 weight percent polymeric

25 microfibers based on the dry weight of the wipe, the amount of liquid contained within the wet wipe is from about 300 to about 400 weight percent and desirably about 330 weight percent based on the dry weight of the wet wipe. If the amount of liquid is less than the above-identified range, the wet wipe may be too dry and may not adequately perform. If the amount of liquid is greater than the above-identified range, the wet wipe may be

30 oversaturated and soggy and the liquid may pool in the bottom of the container.

Each wet wipe is generally rectangular in shape and may have any suitable unfolded width and length. For example, the wet wipe may have an unfolded length of from about 2.0 to about 80.0 centimeters and desirably from about 10.0 to about 25.0 centimeters

35 and an unfolded width of from about 2.0 to about 80.0 centimeters and desirably from

about 10.0 to about 45.0 centimeters. Each individual wet wipe is typically arranged in a folded configuration and stacked one on top of the other to provide a stack of wet wipes.

Such folded configurations are well known to those skilled in the art and include c-folded, z-folded, quarter-folded configurations and the like. The stack of folded wet
5 wipes may be placed in the interior of a container, such as a plastic tub, to provide a package of wet wipes.

In another particular embodiment of the present invention, the fibrous sheet material of the different aspects of the present invention is intended for use as a bodyside liner for
10 an absorbent article such as a diaper. Such absorbent articles generally include a substantially liquid impermeable outer cover, a porous, liquid permeable bodyside liner positioned in facing relation with the outer cover, and an absorbent body, such as an absorbent pad, which is located between the outer cover and the bodyside liner. The
15 absorbent article may also include elastic members, such as leg elastic members and waist elastic members to help reduce leaks. The elastic members are secured to the absorbent article in an elastically contractible condition so that in a normal under strain configuration, the elastic members effectively contract against the absorbent article. The
absorbent article may further include a pair of fasteners which are employed to secure
20 the article about the waist of a wearer. Suitable fasteners include hook-and-loop type fasteners, adhesive tape fasteners, buttons, pins, snaps, mushroom-and-loop fasteners, and the like. Other suitable components may also be incorporated on the absorbent article.

The absorbent article may be of various suitable shapes. Examples of diaper
25 configurations suitable for use in connection with the instant application and other diaper components suitable for use on diapers are described in U.S. Patent 4,798,603 issued January 17, 1989, to Meyer et al.; U.S. 5,176,668 issued January 5, 1993, to Bernardin; U.S. 5,176,672 issued January 5, 1993, to Bruemmer et al.; U.S. 5,192,606 issued March 9, 1993, to Proxmire et al., and U.S. 5,509,915 issued April 23, 1996, to Hanson
30 et al., the disclosures of which are herein incorporated by reference to the extent they are consistent herewith.

The various components of the article are integrally assembled together employing various types of suitable attachment means, such as adhesive, sonic bonds, thermal
35 bonds or combinations thereof. For example, the outer cover and bodyside liner may be

assembled to each other and to the absorbent body with adhesive, such as a hot melt, pressure-sensitive adhesive. The adhesive may be applied as a uniform continuous layer of adhesive, a patterned layer of adhesive, a sprayed pattern of adhesive, or an array of separate lines, swirls or dots of adhesive. Similarly, other components, such as the elastic members and the fasteners, may be assembled into the article by employing the above-identified attachment mechanisms.

The outer cover of the article may suitably be composed of a material which is either liquid permeable or liquid impermeable. It is generally preferred that the outer cover be formed from a material which is substantially impermeable to liquids. For example, a typical outer cover can be manufactured from a thin plastic film or other flexible liquid-impermeable material. If it is desired to present the outer cover with a more clothlike feeling, the outer cover may comprise a polyolefin film having a nonwoven web laminated to the outer surface thereof, such as a spunbond web of polyolefin fibers. For example, a stretch-thinned polypropylene film having a thickness of about 0.015 millimeter (0.6 mil) may have thermally laminated thereto a spunbond web of polypropylene fibers, which fibers have a thickness of about 1.5 to 2.5 denier per filament, which nonwoven web has a basis weight of about 17 grams per square meter (0.5 ounce per square yard). Methods of forming such clothlike outer covers are known to those skilled in the art.

Further, the outer cover may be formed of a woven or nonwoven fibrous web layer which has been totally or partially constructed or treated to impart a desired level of liquid impermeability to selected regions that are adjacent or proximate the absorbent body. Still further, the outer cover may optionally be composed of a micro-porous "breathable" material which permits vapors to escape from the absorbent body while still preventing liquid exudates from passing through the outer cover.

The bodyside liner suitably presents a bodyfacing surface which is compliant, soft feeling, and nonirritating to the wearer's skin. Further, the bodyside liner may be less hydrophilic than the absorbent body, to present a relatively dry surface to the wearer, and may be sufficiently porous to be liquid permeable, permitting liquid to readily penetrate through its thickness. The bodyside liner is suitably employed to help isolate the body of the wearer from any exudates contained within the article.

The bodyside liner of the absorbent article may be manufactured from a wide selection of web materials, such as woven and nonwoven fabrics as described above as being suitable for the fibrous sheet materials of the present invention. For example, the bodyside liner may be composed of a meltblown or spunbonded web of polyolefin fibers.

5 The bodyside liner may also be a bonded-carded web composed of natural and/or synthetic fibers. The bodyside liner may be composed of a substantially hydrophobic material, and the hydrophobic material may, optionally, be treated with a surfactant or otherwise processed to impart a desired level of wettability and hydrophilicity. In a particular embodiment of the present invention, the bodyside liner comprises a
10 nonwoven, spunbond, polypropylene fabric composed of about 2.8-3.2 denier fibers formed into a web having a basis weight of about 20 grams per square meter and a density of about 0.13 gram per cubic centimeter. The bodyside liner may also be surface treated with about 0.28 weight percent of a surfactant commercially available from the Rohm and Haas Co. under the trade designation Triton X-102.

15 The bodyside liner of the present invention also includes oat extract which is configured to protect and provide a soothing effect to the skin of the wearer. As described above the oat extract is desirably solubilized to provide an oat extract solution which is then applied to the bodyside liner material. The oat extract solution may be applied by any
20 conventional means, such as dipping, spraying, printing, brush coating or the like. The oat extract solution may be applied to the entire bodyside liner or may be selectively applied to particular sections of the bodyside liner, such as the medial section along the longitudinal centerline of the absorbent article, to provide improved skin sensitivity to such sections. Alternatively, the oat extract may be applied to bodyside liner in a
25 substantially dry state or in an encapsulated state.

The oat extract may otherwise be impregnated into a porous or microporous carrier material which is then incorporated into the absorbent article. In addition, if the bodyside liner of the absorbent article is relatively porous, the oat extract may be applied to a layer
30 between the bodyside liner and the absorbent body of the diaper. In such a configuration, the oat extract may migrate through the bodyside liner to provide the soothing effect to the skin.

The absorbent body of the absorbent article may suitably comprise a matrix of hydrophilic
35 fibers, such as a web of cellulosic fluff, mixed with particles of a high-absorbency material

commonly known as superabsorbent material. In a particular embodiment, the absorbent body comprises a matrix of cellulosic fluff, such as wood pulp fluff, and superabsorbent hydrogel-forming particles. The wood pulp fluff may be exchanged with synthetic, polymeric, meltblown fibers or with a combination of meltblown fibers and natural fibers.

5 The superabsorbent particles may be substantially homogeneously mixed with the hydrophilic fibers or may be nonuniformly mixed. The fluff and superabsorbent particles may also be selectively placed into desired zones of the absorbent body to better contain and absorb body exudates. The concentration of the superabsorbent particles may also vary through the thickness of the absorbent body. Alternatively, the absorbent body may
10 comprise a laminate of fibrous webs and superabsorbent material or other suitable means of maintaining a superabsorbent material in a localized area.

The absorbent body may have any of a number of shapes. For example, the absorbent core may be rectangular, I-shaped, or T-shaped. It is generally preferred that the
15 absorbent body be narrower in the crotch area than in the front or rear portions of the article. The size and the absorbent capacity of the absorbent body should be compatible with the size of the intended wearer and the liquid loading imparted by the intended use of the absorbent article.

20 The high-absorbency material can be selected from natural, synthetic, and modified natural polymers and materials. The high-absorbency materials can be inorganic materials, such as silica gels, or organic compounds, such as crosslinked polymers. The term "crosslinked" refers to any means for effectively rendering normally water-soluble materials substantially water insoluble but swellable. Such means can include, for
25 example, physical entanglement, crystalline domains, covalent bonds, ionic complexes and associations, hydrophilic associations such as hydrogen bonding, and hydrophobic associations or Van der Waals forces.

Examples of synthetic, polymeric, high-absorbency materials include the alkali metal and
30 ammonium salts of poly(acrylic acid) and poly(methacrylic acid), poly(acrylamides), poly(vinyl ethers), maleic anhydride copolymers with vinyl ethers and alpha-olefins, poly(vinyl pyrrolidone), poly(vinyl morpholinone), poly(vinyl alcohol), and mixtures and copolymers thereof. Further polymers suitable for use in the absorbent core include natural and modified natural polymers, such as hydrolyzed acrylonitrile-grafted starch,
35 acrylic acid grafted starch, methyl cellulose, carboxymethyl cellulose, hydroxypropyl

- cellulose, and the natural gums, such as alginates, xanthum gum, locust bean gum, and the like. Mixtures of natural and wholly or partially synthetic absorbent polymers can also be useful in the present invention. Such high-absorbency materials are well known to those skilled in the art and are widely commercially available. Examples of
- 5 superabsorbent polymers suitable for use in the present invention are SANWET IM 3900 polymer available from Hoechst Celanese located in Portsmouth, Virginia and DOW DRYTECH 2035LD polymer available from Dow Chemical Co. located in Midland, Michigan.
- 10 The high absorbency material may be in any of a wide variety of geometric forms. As a general rule, it is preferred that the high absorbency material be in the form of discrete particles. However, the high absorbency material may also be in the form of fibers, flakes, rods, spheres, needles, or the like. As a general rule, the high absorbency material is present in the absorbent body in an amount of from about 5 to about 90
- 15 weight percent based on total weight of the absorbent body.

- Accordingly, the different aspects of the present invention can advantageously provide fibrous sheet materials which incorporate oat extract to provide a soothing effect to the skin of the wearer. The oat extract may also reduce redness, itching and irritation of the
- 20 wearers skin. The use of oat extract, when compared to other oat derivatives, provides a soluble, relatively stable component for use with fibrous sheet materials which does not have a bad odor. Such fibrous sheet materials can advantageously be used for wet wipes such as baby wipes, hand wipes, face wipes, household wipes, industrial wipes and the like or in other sheet applications such as bed linens. The fibrous materials may
- 25 also be used for facial tissues, bathroom tissue or towels or as materials in absorbent articles such as diapers or bandages which are intended to be in contact with the skin of the wearer.

- While the invention has been described in detail with respect to the specific aspects
- 30 thereof, it will be appreciated that those skilled in the art, upon attaining an understanding of the foregoing, may readily conceive of alterations to, variations of, and equivalents to these aspects. Accordingly, the scope of the present invention should be assessed as that of the appended claims and any equivalents thereto.

What is claimed is:

1. A fibrous sheet material intended for contact with skin of a user comprising a sheet of fibers which includes oat extract to provide a soothing effect to said skin.
2. The fibrous sheet material of claim 1 wherein said fibrous sheet material includes an oat extract solution which includes said oat extract and a solubilizing agent.
3. The fibrous sheet material of claim 2 wherein said solubilizing agent is butylene glycol.
4. The fibrous sheet material of claim 2 wherein said solubilizing agent is glycerin.
5. The fibrous sheet material of claim 2 wherein said solubilizing agent is aqueous sorbitol.
6. The fibrous sheet material of claim 2 wherein said oat extract solution comprises from about 0.5 to about 50 weight percent of said oat extract and from about 10 to about 90 weight percent of said solubilizing agent based on a total weight of said solution and water.
7. The fibrous sheet material of claim 2 wherein said oat extract solution comprises about 10 weight percent of said oat extract, about 45 weight percent of said solubilizing agent and about 45 weight percent water based on a total weight of said solution.
8. The fibrous sheet material of claim 1 wherein said fibrous sheet material is adapted for use as a facial tissue.
9. A wet wipe which includes an aqueous liquid which comprises an oat extract solution, a preservative, and water.
10. The wet wipe of claim 9 wherein said wet wipe includes from about 150 to about 600 weight percent of said aqueous liquid based on a dry weight of said wet wipe.
11. The wet wipe of claim 9 wherein said aqueous liquid includes from about 0.5 to about 10.0 weight percent of said oat extract solution based on a total weight of said liquid.

12. The wet wipe of claim 9 wherein said aqueous liquid includes from about 1.0 to about 3.0 weight percent of said oat extract solution based on a total weight of said liquid.

13. The wet wipe of claim 9 wherein said oat extract solution includes oat extract, a solubilizing agent and water.

14. The wet wipe of claim 13 wherein said oat extract solution includes from about 0.5 to about 50 weight percent of said oat extract and from about 10 to about 90 weight percent of said solubilizing agent based on a total weight of said solution.

15. The wet wipe of claim 13 wherein said oat extract solution includes about 10 weight percent of said oat extract, about 45 weight percent of said solubilizing agent, and about 45 weight percent water based on a total weight of said solution.

16. The wet wipe of claim 13 wherein said solubilizing agent is butylene glycol.

17. The wet wipe of claim 13 wherein said solubilizing agent is glycerin.

18. A wet wipe which includes from about 150 to about 600 weight percent of an aqueous liquid which comprises:

a) from about 0.5 to about 10 weight percent of an aqueous oat extract solution which includes from about 0.5 to about 20 weight percent oat extract and from about 30
5 to about 60 weight percent of a solubilizing agent based on a total weight of said solution;

b) from about 0.1 to about 1.0 weight percent of a preservative; and

c) water.

19. The wet wipe of claim 18 wherein said solubilizing agent is butylene glycol.

20. The wet wipe of claim 18 wherein said preservative is sodium hydroxymethylglycinate.

21. The wet wipe of claim 18 wherein said preservative is benzoic acid.

22. The wet wipe of claim 18 wherein said aqueous liquid further comprises a surfactant.

23. An absorbent article which comprises:

- 10 a) a substantially liquid impermeable outer cover;
- b) a liquid permeable bodyside liner which is positioned in facing relation with said outer cover wherein said bodyside liner includes oat extract to provide a soothing effect to a wearer's skin; and
- c) an absorbent body located between said outer cover and said bodyside liner.

24. The absorbent article of claim 23 wherein said oat extract is provided in an oat extract solution which includes said oat extract and a solubilizing agent.

25. The absorbent article of claim 24 wherein said solubilizing agent is butylene glycol.

26. The absorbent article of claim 24 wherein said solubilizing agent is glycerin.

27. The absorbent article of claim 24 wherein said oat extract solution comprises from about 0.5 to about 20 weight percent of said oat extract and from about 30 to about 60 weight percent of said solubilizing agent based on a total weight of said solution and water.

15

INTERNATIONAL SEARCH REPORT

Intern. Appl. No.
PCT/US 97/10724

A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 195 15 609 C (KAO CORP GMBH) 28 March 1996 see the whole document ---	1-27
Y	EP 0 688 901 A (KIMBERLY CLARK CO) 27 December 1995 see the whole document ---	1-27
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>DATABASE WPI Week 9646 Derwent Publications Ltd., London, GB; AN 96461260 XP002045750 "Antiinflammatori composition for bathing-containing aqueous and/or water soluble organic solvent extract of seeds of Avena sativa L., aluminium salt and carbonate" see abstract & JP 08 231 379 A (KAO CORP.) 10 September 1996</p> <p style="text-align: center;">---</p>	1-27
Y	<p>US 4 943 350 A (BOGART LARRY ET AL) 24 July 1990 see the whole document</p> <p style="text-align: center;">---</p>	1-27
Y	<p>DATABASE WPI Week 9359 Derwent Publications Ltd., London, GB; AN 93402391 XP002045751 N M KASIMTSOVA: "Face cream which does not irritate or sensitise the skin-containing additional silicone oil, confectionery fat, stearyl stearate and extracts of oats, barley and lavender to improve quality." see abstract & SU 1 776 407 A (AEROZOL SCI PRODN ASSOC) 23 November 1992</p> <p style="text-align: center;">---</p>	1-27
Y	<p>WO 96 16681 A (PROCTER & GAMBLE) 6 June 1996 see the whole document</p> <p style="text-align: center;">-----</p>	1-27

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Appl. Application No

PCT/US 97/10724

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(21) International Application Number: PCT/US00/11425 (22) International Filing Date: 28 April 2000 (28.04.00) (30) Priority Data: 09/302,425 30 April 1999 (30.04.99) US (71) Applicant (for all designated States except US): SINTAL INTERNATIONAL, INC. [US/US]; Ives I-95 Business Center, 20253 N.E. 15th Ct., Miami, FL 33179 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): DANIELI, Jacob [US/US]; 1239 Devonshire Road, Buffalo Grove, IL 60089 (US). (74) Agent: WELLS, Ashley, J.; Venable, P.O. Box 34385, Washington, DC 20043-9998 (US).		(81) Designated States: BR, CA, CN, HU, ID, IL, JP, KR, MX, PL, SG, TR, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: ANTI-BACTERIAL COMPOSITION AND USE THEREOF FOR SKIN CARE AND FABRIC TREATMENT		
(57) Abstract <p>This invention relates to a water-based composition having at least one of anti-bacterial or anti-fungal properties and use thereof for skin care and for fabric treatment. The composition is not only effective as an anti-bacterial and/or anti-fungal material when included in a skin care gel or lotion for topical use, such as in a sun screen composition, or in conjunction with sanitary elastic gloves as a coating therein, it is gentle to the user's skin and may include constituents which advantageously indicate its presence. The composition is not only effective as an anti-bacterial and/or anti-fungal material when used as a liquid to treat fabric employed for personal hygiene aids including disposable diapers for children and adults, sanitary napkins, and wipes, it is gentle to the skin and may be formulated to provide odor control. Users include humans and animals.</p>		

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ANTI-BACTERIAL COMPOSITION AND USE THEREOF FOR SKIN CARE AND FABRIC TREATMENT

This invention relates to a water-based composition having at least one of anti-bacterial or anti-fungal properties and use thereof for skin care and for fabric treatment. The composition is not only effective as an anti-bacterial and/or anti-fungal material when included in a skin care gel or lotion for topical use, such as in a sun screen composition, or in conjunction with sanitary elastic gloves as a coating therein, it is gentle to the user's skin and may include constituents which advantageously indicate its presence. The composition is not only effective as an anti-bacterial and/or anti-fungal material when used as a liquid to treat fabric employed for personal hygiene aids including disposable diapers for children and adults, sanitary napkins, and wipes, it is gentle to the skin and may be formulated to provide odor control. Users include humans and animals.

Since about May, 1997 the inventor began offering for sale a lotion, which is a water-based composition useful as an antiseptic barrier for pre- and post-milking, and dry period treatment of the teats of milk cows under the trade name tSHIELD™ (Quest Research, Inc.). This composition is formulated as a soothing dip or lotion for topical application or is impregnated in toweling used as a cleansing wipe. The lotion product shields the skin of the cow against bacterial penetration for up to four days and may be marked with a dye to indicate its presence and hence provide an effectiveness indicator.

The composition includes four anti-bacterially-active constituents known to target bacteria commonly found for this application, namely, in % by weight based on the weight of the total composition, 0.30 % of a Quaternium 12 (C.T.F.A. name, i.e., a Cosmetic, Toiletries, and Fragrances Association name), such as BORDAC 2250 a disinfectant manufactured by Lonza, Inc.; 2.80 % of a Cetrimonium chloride (C.T.F.A. name), which is cetyl trimethyl ammonium chloride, a disinfectant manufactured by Lonza, Inc, under the tradename CARSOQUAT CT-429; 2.80 % of a combination of Behentrimonium metholsulfate & stearyl alcohol (C.T.F.A. name), which is a disinfectant manufactured by ISP Corporation; and 0.10 % Cetylpyridinium chloride.

The composition additionally includes silicone fluids, i.e., 0.90 % of SILICONE 344 and 0.70 % of SILICONE 1401 (manufactured by Dow Corning) to improve adherence of the lotion to the cow's teats, as well as other ingredients including emulsifiers, colorants, such as about 0.0023 % by weight of FD&C Red, 5 fragrances, and diluents, such as from about 85 to about 90 % deionized water.

In about May, 1998, the inventor began offering for sale a water-based gel composition useful as an anti-bacterial hand wash for humans, particularly in medical hygiene applications, under the trade name QUATRO- DERM™ (Quest Research, Inc.). This composition includes four active constituents, hence the name "quatro", 10 namely, in % by weight based on the weight of the total composition, 0.1 % of a Quaternium 12 (C.T.F.A. name), such as BORDAC 2250 a disinfectant manufactured by Lonza, Inc.; 0.5 % of Didecyl-dimethyl ammonium chloride; 1.0 % of a Cetrimonium Chloride (C.T.F.A. name), which is cetyl trimethyl ammonium chloride, a disinfectant manufactured by Lonza, Inc. under the tradename 15 CARSOQUAT CT-429; and 0.04 % of CHG 20 % (a chlorohexidine gluconate manufactured by Degussa AG).

The composition additionally includes various other constituents, such as 1.25 % of METHOCEL 40-101 (manufactured by Dow Chemical Corporation) as a thickening agent to provide a viscosity of about 4000 centipoise to the composition, 20 and 0.5 % GERMABEN II (manufactured by ISP Corporation) as a formaldehyde donor for the composition.

This composition was not as gentle to the user's skin as was desired, suffered from color instability, and, in any event, was not free of formaldehyde due to the presence of GERMABEN II.

25 It is an object of the present invention to provide an anti-bacterial composition, which is gentle, which can be used repetitively, and yet which is anti-bacterially effective for humans and animals.

It is another object of the present invention to provide an anti-bacterial composition, which is gentle, which can be used repetitively, and yet which is anti- 30 bacterially effective for humans and animals, and which leaves no visible residue yet has a sustained functional activity.

It is a further object of the present invention to provide an anti-fungal composition, which is gentle, which can be used repetitively, and yet which is effective as an anti-fungal material for humans and animals.

It is another object of the present invention to provide a fabric hygiene article, such as a disposable diaper (child and adult), a feminine hygiene pad, and a wipe for men and women but having particular utility for women for use in the groin, rectum, inner ears, eyelids, and for makeup removal which also treats the skin, containing the anti-bacterial and/or antifungal composition of the present invention.

It is yet another object of the present invention to provide a sanitary elastic glove having a coating provided on at least the inner surface thereof comprising an anti-bacterial and/or anti-fungal composition of the present invention.

These and other objects are accomplished by the present invention which provides a composition which is a gel or lotion and which has at least one of anti-bacterial or anti-fungal properties, comprising from about 85 to about 90 % by weight of pure water, such as deionized water, from about 0.80 to about 1.3 % by weight of Cetrimonium chloride; and from about 0.07 to about 0.08 % by weight of at least one substance selected from the group consisting of Benzalkonium chloride and Grapefruit seed extract; from about 0.15 to about 0.35 % by weight of Didecyl-dimethyl ammonium chloride; and from about 0.08 % to about 1.55 % of Quaternium 22.

The gel or lotion composition is a non-toxic, non-flammable, non-drying, non-irritating cleanser. It is advantageously alcohol-free, pH balanced, and does not leave any residue on body parts such as the breasts of nursing mothers or in the mother's milk.

The compositions according to the invention contain no toxic metals, such as arsenic, and no formaldehyde, yet have a very long shelf life. The compositions are gentle enough for any skin type including, but not limited to, lips, breasts, groin, rectal, and eye areas, and may be used repetitively with no adverse effects.

The present invention additionally provides a fabric hygiene article selected from the group consisting of a disposable diaper, a feminine hygiene pad, and a wipe, comprising a fabric assembly; and a water-based composition comprised of from about 85 to about 90 % by weight of water; from about 2.20 to about 3.00 % by

weight of Behentrimonium metholsulfate & stearyl alcohol; from about 0.15 to about 0.33 % by weight of Quaternium 12; from about 0.80 to about 3.00 % by weight of Cetrimonium chloride; and from about 0.08 % to about 1.55 % of Cetylpyridinium chloride present in an amount which is at least effective to provide anti-bacterial and/or anti-fungal properties to the surface of the fabric assembly which contacts the user. The amount of composition used may range up to an amount which does not substantially prevent moisture uptake by the fabric assembly. The wipe is preferably completely saturated by the water-based composition and is made of a non-woven fabric composed of a material such as a natural material, for example, a cotton pulp, or a synthetic material such as polyester fibers.

The present invention further provides a sanitary glove, comprising a glove comprised of an elastic material; and a coating provided on at least a part of the inner surface of the glove and being comprised of a water-based composition having at least one of anti-bacterial or anti-fungal properties and comprising from about 85 to about 90 % by weight of water; from about 2.20 to about 3.00 % by weight of Behentrimonium metholsulfate & stearyl alcohol; from about 0.15 to about 0.33 % by weight of Quaternium 12; from about 0.80 to about 3.00 % by weight of Cetrimonium chloride; and from about 0.08 % to about 1.55 % of Cetylpyridinium chloride.

The composition for skin care of the present invention includes four anti-bacterially active constituents, namely, from about 0.80 to about 1.30 %, preferably about 1.20 %, by weight of Cetrimonium chloride and from about 0.07 to about 0.08 %, preferably about 0.08 %, by weight of at least one substance selected from the group consisting of Benzalkonium chloride and Grapefruit seed extract; from about 0.15 to about 0.35 %, preferably about 0.30, by weight of Didecyl-dimethyl ammonium chloride; and from about 0.08 % to about 1.55 %, preferably about 0.1%, of Quaternium 22 (C.T.F.A. name), such as those manufactured by Lonza, Inc. as anti-bacterially effective constituents. These materials are additionally effective as anti-fungal materials. When one or more of these four active constituents are used in small concentrations, they then function more as a preservative.

The composition of the present invention may additionally includes thickening agents, such as from about 0.09 to about 1.20 %, preferably about 1.00 %, by weight of NATRASOOL HHR 250 manufactured by Aqualon Corporation or METHOCEL 40-101 manufactured by Dow.

5 The composition additionally may includes moisturizers, such as from about 0.09 to about 0.12 %, preferably about 0.10 %, by weight of aloe vera extract. Lanolin or glycerine may be included, and additional materials such as Vitamin E and citric acid may be added.

10 The composition may additionally include an organoleptically effective constituent for odor control, namely, from about 1.00 to about 2.50 %, preferably about 2.50 %, by weight of a sodium salt of an organic sesquicarbonate, such as those manufactured by Dow Chemical.

15 The anti-bacterial composition for sanitary elastic glove application of the present invention includes four anti-bacterially active constituents, namely, from about 0.15 to about 0.33 %, preferably about 0.30 %, by weight of Quaternium 12 (C.T.F.A. name) such as that manufactured by Lonza, Inc.; from about 0.80 to about 3.00 %, preferably 2.80 %, by weight of Cetrimonium chloride; from about 2.20 to about 3.00 %, preferably about 2.80 %, by weight of Behentrimonium metholsulfate & stearyl alcohol (C.T.F.A. name); and from about 0.08 to about 1.55 %, preferably 20 0.10 % by weight of Cetylpyridinium chloride (C.T.F.A. name), such as those manufactured by Croda, as anti-bacterially effective constituents. These materials are additionally effective as anti-fungal materials.

25 The composition of the present invention additionally includes thickening agents, such as from about 0.80 to about 1.20 %, preferably about 0.90 %, by weight of CYCLOMETHICONE manufactured by Dow Chemical, and from about 0.05 to about 0.90 %, preferably about 0.07%, by weight of CYCLOMETHICONE DIMETHICONOL manufactured by Dow Chemical..

30 The composition additionally includes moisturizers, such as from about 0.09 to about 0.12 %, preferably about 0.10 %, by weight of aloe vera extract, and Vitamin E and glycerine.

The composition may additionally include an organoleptically effective constituent for odor control, namely, from about 1.00 to about 2.50 %, preferably about 2.50 %, by weight of a sodium salt of an organic sesquicarbonate.

The composition may additionally include an indicator for activity which
5 advises a human user or observer of the presence or absence of the composition either by color, or absence thereof, or by fragrance or absence thereof. For example, a dye may be employed such as, by way of example but not limitation, FD&C Red #28 or Red Fluorescent #40. The dye material, moreover, may have any suitable color and may change color depending on the pH of the skin of the recipient. Any suitable
10 water-soluble fragrance may be used, such as those manufactured by ARILYSENCE. For example, cherry fragrance may be included.

Further advantages and features will become apparent from the detailed description below taken with the drawings in which:

15 Figure 1 illustrates in cross-section a treated fabric assembly, such as commonly employed in a sanitary napkin or disposable diaper, showing that the anti-bacterial and/or anti-fungal composition of the present invention is impregnated into at least the surface of the fabric assembly which contacts the user's skin;

Figure 2 illustrates in cross-section a portion of a sanitary elastic glove
20 provided on its inner surface with a coating composed of the anti-bacterial and/or anti-fungal composition of the present invention; and

Figure 3 schematically illustrates an apparatus for mixing and magnetically treating a composition according to the invention.

25 Figure 1 shows a cross-section of a treated fabric assembly 1 having an inner padding 2 and outer fabric cover layers 3, 4, such as commonly employed in a sanitary napkin or in a disposable diaper, with the anti-bacterial and/or anti-fungal composition of the present invention impregnated into at least a surface area 5 of the outer cover layer 3 which contacts the user's skin.

30 Figure 2 shows in cross-section a portion of an elastic glove 10 including an elastic layer 11 composed of, for example latex or vinyl, and a coating 12 composed

of the anti-bacterial and/or anti-fungal composition of the present invention applied as a coating onto inner surface 13 of the latex glove 10.

Figure 3 schematically illustrates an apparatus 20 for mixing and magnetically treating a composition according to the invention. The apparatus includes a mixing vessel 21 including a tank 22, stirring means 23 shown as a shaft 24 provided with stirring blades 25 powered by a motor 26, heating means 27 shown as resistance heater 28 (not to scale), and lids 29 for retaining heat within the vessel 21. A magnetic field generation means shown generally at 30 is positioned in a manner effective to magnetically influence the composition within the tank. In the schematic illustration of Figure 3, the magnetic field generation means 30 includes at least two electrodes 31 (anode 31a and cathode 31b) provided with wound coils of wire 32a, 32b respectively surrounding conductive metal rods 33a, 33b, and at least one D.C. power source 34 sufficient to provide a current at the at least two electrodes 31a, 31b ranging from about 20 up to but less than about 40 amperes. The at least two electrodes 31 are mounted on a bridge 35 which extends the width of the tank 22 but which is electrically insulated from tank 22 which may be made of stainless steel. The tank 22 is provided with a drain line 40 and valve 41.

The apparatus of Figure 3 may be employed to practice a method of manufacturing a composition according to the invention, which method includes, in the order recited, providing the mixing vessel 21 including the tank 22, stirring means 23 positioned within the tank 22, and a magnetic field generation means 30 positioned in a manner effective to magnetically influence the composition within the tank 22. The mixing vessel 21 is filled with about one half of the water and the water is heated to a temperature of about 50°C. The at least four active ingredients of the composition of according to the invention are added to the water in the mixing vessel 21, and are stirred slowly and at low shear to provide a pre-mix. The pre-mix is treated in a magnetic field having a field strength and for a time effective to increase specific gravity of the pre-mix to a specific gravity ranging from 1.015 to 1.018. The remainder of the water is added to provide a treated mixture.

The water is advantageously allowed to relax prior to heating. The at least four active ingredients are preferably added to the water in the mixing vessel 21 slowly, sequentially, and with the stirring means 23 operating at low shear.

The method may additionally include adding at least one additional constituent
5 to the treated mixture slowly and with mixing at low shear. The at least one additional constituent is advantageously selected from the group consisting of a thickening agent, a moisturizer, a surfactant, an organoleptically effective ingredient for odor control, a dye, and a fragrance, examples of which are discussed in the following. When at least two additional constituents are added to the treated mixture,
10 the method advantageously additionally includes mixing the at least two additional constituents together in a separate vessel (not shown) prior to adding same to the treated mixture in vessel 21.

The pre-mix is treated in a magnetic field for a time ranging from about 1 to about 60 minutes, preferably, for a time ranging from about 20 to about 40 minutes.

15

Pilot Plant Apparatus

The mixing vessel employed was cylindrical as illustrated in Figure 3 and had a diameter of about six and one half feet and a depth of about four feet. Batches of about 250 gallons were made and each batch filled the mixing vessel to a depth of
20 about three feet. Two electrodes for generating a magnetic field were provided, i.e., an anode and a cathode, and were separated from one another by a distance of about six feet. The stirring blades extended about six feet taken as a whole, were positioned beneath the lower ends of the two electrodes, and were powered by a one half horsepower, variable speed motor.

25 The anode and cathode were each constructed of about 25 foot lengths of current-carrying copper wire which had a thickness of about that of telephone wire and which was wound around a three foot length of steel rod having a one and one quarter inch diameter. The wire was wound in the middle portion of the respective steel rods. No wire was wound on the ends of the steel rods so that about six inches
30 of rod remained at each respective end thereof. The wire was coiled into a series of turns which were positioned as close together as possible.

The magnetic field generation means was advantageously configured to provide a current at the coils of about 30 amps for time period of about 20 minutes, with a D.C. voltage applied of about 24 volts. These parameters are provided by way of example, but not limitation. As one of skill in the magnetic art would recognize, the parameters which define the electric field, including the length of the electrodes, the distance between them, and the D.C. voltage applied to them, may be varied over a wide range. Similarly, the parameters which define the magnetic field, including the number of turns, the cross-sectional area of the coils, and the current at the coils, may be varied over a wide range.

The color and the specific gravity of the mixture varied during magnetic treatment and were used to monitor progress. The color of the mixture starts out as water white and turns a light yellow during magnetic treatment indicating that some type of change is occurring, such as perhaps formation of a complex or coordination compound between one or more of the four active ingredients. Current below about 20 amps was found to require too much time for the desired changes in color and specific gravity to occur. Current of 40 amps or more was found to undesirably turn the composition a dark yellow-brown color. The specific gravity of the compositions being magnetically treated gradually increased to a range of from 1.015 to 1.018.

In the pilot plant apparatus employed, the magnetic field generation means produced a large field parallel to the axis of the electrodes (in the z-direction). Between these magnetic field generation electrodes (anode and cathode), the fields from individual coils added together to form a very strong field along the center line between the anode and the cathode. Components of the magnetic field in other directions were cancelled by opposing fields from neighboring coils. Outside of the magnetic field generation means, the magnetic field was very weak due to the cancellation effect. For magnetic field generation electrodes that are long in comparison to their diameter, the field is very close to zero.

While the magnetic field was not measured, the magnitude of the magnetic field was calculated using Ampere's law. Ampere's law relates to the circulation of B around a closed loop to the current flux through the loop $\times \mu_0$ (Formula 1). This gives the magnetic field along the center line between the electrodes. It is noted that since the magnitude of the current changes with time, so also does B_0 , i.e., for a sinusoidally varying current, N/L is the amplitude (maximum value) of the field. Thus, one can also

refer to the value of $|B_o|$ called, the root-mean-square (RMS) value, and $BRMS = |B_o| / \sqrt{2}$ (Formula 2).

The time-variation of the magnetic field also shows BRMS. However, this doesn't tell you what the magnetic field outside the electrodes is. To calculate this you need to use the Biot-Savart law. From symmetry, along the z-axis all the components of the field due to a current loop cancel, except the component in the z-direction. So $\langle B_z \rangle = \frac{\mu_0 I}{4\pi} \int \frac{dz}{R^3}$ (Formula 3) at a position z along the axis of the electrode(s) is given by where R = radius of the loop. This Formula 3 shows B as a function of z when z; R. Note that B decreases rapidly as z increases.

10

Example 1: Glove Coating Composition (QUATROGLOVE) And Method

A composition suitable for dip coating the interior of an elastic glove was prepared and included the following constituents in amounts by weight as stated.

0.5% of N-alkyl-dimethylbenzyl-ammonium chloride (for example, BARQUAT MB-50, by Lonza, Inc. or Pacific Coast Chemicals);

1.0% of Cetramonium Chloride (for example, CARSOQUAT CT-429, Cetyltrimethylammonium chloride, by Lonza, Inc. or Pacific Coast Chemicals);

1.0% of OCTOXYNOL-9;

0.2% of Quaternium 22;

2.4% of Chlorohexadine gluconate (CHG, 4%);

0.1% of cherry fragrance;

30.0% of Dimethicone (a silicone fluid);

2.0% of Incroquat Behenyl (tms); and

62.79% of water (deionized water or distilled water is used).

About half of the water was filled into a first mixing vessel, which corresponded to the pilot plant apparatus schematically illustrated in Figure 3, was allowed to relax, and was heated to about 50°C. The N-alkyl-dimethylbenzyl-ammonium chloride, Cetramonium Chloride, OCTOXYNOL-9, Quaternium 22, and Chlorohexadine gluconate were added to the heated water slowly and sequentially, and were stirring slowly and at low shear to provide a first mixture. The first mixture was treated in a magnetic field having a field strength and for a time effective

to increase specific gravity of the first mixture to a specific gravity ranging from 1.015 to 1.018, i.e., about 20 to 30 minutes.

The color of the first mixture was seen to change from a clear water-white to a light yellow color which the inventor considers may be due to formation of a complex having extended conjugation and hence the color change. Moreover, treatment in a magnetic field took place at a current at the magnetic coils of about 30 amps with about 24 volts applied. If the current was lowered to about 20 amps, the treatment required an impractical, extended amount of time to achieve the desired specific gravity range. If the current was increased to 40 amps, the mixture turned an aesthetically unpleasant dark yellow-brown color which, as a practical matter, would not be useful for this type of composition and which may be due, at least in part, to undesirable electrolysis of the constituents.

The remaining half of the water was filled into a second mixing vessel and heated to a temperature of about 50°C. The Cherry Fragrance, Dimethicone (a silicone fluid), and Incroquat Behenyl (tms) were added to the water in the second mixing vessel and were stirred to obtain a second mixture having a specific gravity of 0.87. This second mixing vessel was not provided with a magnetic treatment means.

The second mixture was then slowly added to the first mixture in the first mixing vessel with stirring at low shear to provide a composition suitable for spray coating the interior of an elastic glove. The pH of the composition ranged between 5.5 to 7.0. The specific gravity of the composition ranged between 0.85 to 0.89 with respect to water.

A latex composition was coated onto a mold maintained at about 50°C to form a green latex glove. The green latex glove while still on the mold was dipped into the composition according to the invention to form a coating thereon, and was dried in a hot air tunnel maintained at a temperature ranging from about 110 to 120°C. The glove was removed from the mold and turned inside out so that the coating of the inventive composition was present on the inside of the glove.

Example 2: Glove coating Composition (QUATROGLOVE)

A liquid composition having a viscosity of 800 cps was prepared and included the following four active constituents as percent by weight:

0.13% of Quaternium 12 (useful range 0.08 – 0.13%);
2.8% of Cetrimonium chloride (useful range 0.80 – 3.00%);
2.8% of Behentimonium methosulfate & Stearyl alcohol
(useful range 2.20 – 3.00%); and

5 0.1% of Cetylpyridinium chloride (useful range 0.08 – 1.55%). These were mixed in an apparatus and treated with a magnetic field as described in Example 1.

The composition additionally included the following constituents which were mixed in a second vessel, heated, and subsequently added to the mixed and magnetically treated active ingredients in the apparatus mentioned above:

10 (1) a thickening agent comprised of:

30.00% of cyclomethicone (useful range 27.20 - 33.80%); and
0.70% of cyclomethicone dimethiconol (useful range 0.05 – 0.90%);

(2) a moisturizer comprised of 0.1% of aloe vera extract (useful range 0.09 – 0.12%);

15 (3) a constituent which serves to remove objectionable odors which is 1.0% of at least one sodium salt of an organic sesquicarbonate (useful range 1.00 - 2.50 %); and

(4) an indicator for presence of the composition which is a dye and which is 0.0023% of FC&C red #28 (useful range 0.0021 – 0.0024%); and/or which is a water-
20 soluble fragrance and which is 0.01% of a cherry fragrance (useful range 0.01 – 0.012%).

Example 3: Liquid/Gel Composition (QUATROGUARD)

A liquid composition having a specific gravity of 1.01 was prepared and
25 included water and the following four active constituents as percent by weight:

1.2% of Cetrimonium chloride (useful range 0.80 – 1.30%);
0.3% of Didecyl-dimethyl ammonium chloride (useful range 0.15 – 0.35%);
0.1% of Quaternium 22 (useful range 0.08 – 1.55%); and

0.08% of Benzalkonium chloride (useful range 0.07 – 0.13%). These were
30 mixed in an apparatus and treated for 20 minutes with a magnetic field as described in Example 1. This mixture was then allowed to stand for 30 minutes. Stirring was resumed at low shear and additional constituents were added as follows:

(1) a thickening agent which is 1.0% of Natrosool HHR 250 (useful range 0.002 – 1.50%); and

(2) a moisturizer which is 0.1% of alpe vera extract (useful range 0.09 – 0.12%).

The composition additionally included the following constituents which were
5 mixed with water in a second vessel, heated, and subsequently added to the mixed and magnetically treated active ingredients in the apparatus mentioned above:

(1) a constituent which serves to remove objectionable odors which is 2.50% of at least one sodium salt of an organic sesquicarbonate (useful range 1.00 - 2.50 %); and

10 (2) at least one water-soluble fragrance and which is 0.01% of a cherry fragrance (useful range 0.01 – 0.012%).

This composition can be prepared as a liquid or as a gel by varying the amount of constituents, particularly the thickener as one skilled in the art would understand. This composition or any composition according to the invention can be prepared
15 without the magnetic treatment and be useful for the stated purposes. Magnetic treatment of the active ingredients, however, significantly lengthens the period of time the composition provides functional activity, e.g., anti-bacterial or anti-fungal properties, to the applied area of the recipient, human or animal. An additional advantage is that the magnetically treated composition leaves no visible residue on the
20 applied area of the recipient, human or animal.

It is understood that various other modifications will be apparent to and can be readily made by those skilled in the art without departing from the scope and spirit of the present invention. Accordingly, it is not intended that the scope of the claims appended hereto be limited to the description set forth above but rather that the claims
25 be construed as encompassing all of the features of patentable novelty which reside in the present invention, including all features which would be treated as equivalents thereof by those skilled in the art to which the invention pertains.

CLAIMS

1. A water-based composition having at least one of anti-bacterial or anti-fungal properties, comprising:
- 5 from about 85 to about 90 % by weight of water; and
at least four active ingredients including :
- from about 0.80 to about 1.30 % by weight of Cetrimonium chloride;
from about 0.07 to about 0.08 % by weight of at least one substance
selected from the group consisting of Benzalkonium chloride and Grapefruit seed
10 extract;
from about from about 0.15 to about 0.35 % by weight of Didecyl-
dimethyl ammonium chloride; and
from about 0.08 % to about 1.55 % of Quaternium 22.
- 15 2. The water-based composition according to claim 1, further comprising
a thickening agent.
3. The water-based composition according to claim 2, wherein the
thickening agent is at least one substance selected from the group consisting of
20 NATRASOOL HHR 250 and METHOCEL 40-101, and is present in an amount
ranging from about 0.09 to about 1.20 % by weight.
4. The water-based composition according to claim 1, further comprising
a moisturizer.
- 25 5. The water-based composition according to claim 4, wherein the
moisturizer is at least one substance selected from the group consisting of aloe vera
extract, Vitamin E, citric acid, and glycerine; and is present in an amount ranging
from about 0.09 to about 0.12 % by weight.
- 30

6. The water-based composition according to claim 1, further comprising an organoleptically effective constituent for odor control.

7. The water-based composition according to claim 6, wherein the organoleptically effective constituent is at least one sodium salt of an organic sesquicarbonate and is present in an amount ranging from about 1.00 to about 2.50 %by weight.

8. The water-based composition according to claim 1, further comprising at least one of a dye or a fragrance.

9. A fabric hygiene article selected from the group consisting of a diaper, a sanitary napkin and a wipe, comprising:

a fabric assembly; and

a water-based composition comprised of :

from about 85 to about 90 % by weight of water; and

at least four active ingredients including :

from about 2.20 to about 3.00 % by weight of Behentrimonium metholsulfate & stearyl alcohol;

from about 0.15 to about 0.33 % by weight of Quaternium 12;

from about from about 0.80 to about 3.00 % by weight of Cetrimonium chloride; and

from about 0.08 % to about 1.55 % of Cetylpyridinium chloride.

10. The fabric hygiene article according to claim 9, further comprising a thickening agent.

11. The fabric hygiene article according to claim 10, wherein the thickening agent comprises:

from about 0.80 to about 1.20 % by weight of Cyclomethicone; and

from about 0.05 to about 0.90 % by weight of Cyclomethicone dimethiconol.

12. The fabric hygiene article according to claim 9, further comprising a moisturizer.

5 13. The fabric hygiene article according to claim 12, wherein the moisturizer is at least one substance selected from the group consisting of aloe vera extract, Vitamin E, and citric acid, and is present in an amount ranging from about 0.09 to about 0.12 % by weight.

10 14. The fabric hygiene article according to claim 9, further comprising an organoleptically effective constituent for odor control.

15 15. The fabric hygiene article according to claim 14, wherein the organoleptically effective constituent is at least one a sodium salt of an organic sesquicarbonate and is present in an amount ranging from about 1.00 to about 2.50 % by weight.

16. The fabric hygiene article according to claim 9, further comprising at least one of from about 0.0021 to about 0.0024 % by weight of a dye or a fragrance.

20

17. A sanitary glove, comprising:

a glove comprised of an elastic material; and

a coating provided on at least a part of the inner surface of the glove and being comprised of a water-based composition having at least one of anti-bacterial or anti-fungal properties and comprising:

25

from about 85 to about 90 % by weight of water; and

at least four active ingredients including:

from about 2.20 to about 3.00 % by weight of Behentrimonium methosulfate & stearyl alcohol;

30

from about 0.15 to about 0.33 % by weight of Quaternium 12;

from about from about 0.80 to about 3.00 % by weight of
Cetrimonium chloride; and
from about 0.08 % to about 1.55 % of Cetylpyridinium Chloride.

5 18. The sanitary glove according to claim 17, wherein the water-based
composition further comprises a thickening agent.

 19. The sanitary glove according to claim 18, wherein the thickening
agent comprises:
10 from about 0.80 to about 1.20 % by weight of Cyclomethicone; and
 from about 0.05 to about 0.90 % by weight of Cyclomethicone dimethiconol.

 20. The sanitary glove according to claim 17, wherein the water-based
composition further comprises a moisturizer.

15 21. The sanitary glove according to claim 20, wherein the moisturizer is at
least one substance selected from the group consisting of aloe vera extract and
Vitamin E, and is present in an amount ranging from about 0.09 to about 0.12 % by
weight.

20 22. The sanitary glove according to claim 17, wherein the water-based
composition further comprises an organoleptically effective constituent for odor
control.

25 23. The sanitary glove according to claim 22, wherein the organoleptically
effective constituent is at least one a sodium salt of an organic sesquicarbonate and is
present in an amount ranging from about 1.00 to about 2.50 % by weight.

 24. The sanitary glove according to claim 17, wherein the water-based
30 composition further comprises at least one of from about 0.0021 to about 0.0024 %
by weight of a dye or a fragrance.

25. The sanitary glove according to claim 17, wherein the elastic material is one of latex or vinyl.

5 26. A method of manufacturing a composition according to claim 1, comprising, in the order recited:

providing a mixing vessel including a tank, stirring means positioned within the tank, and a magnetic field generation means positioned in a manner effective to magnetically influence the composition within the tank;

10 filling the mixing vessel with about one half of the water;

heating the water to a temperature of about 50°C;

adding the at least four active ingredients to the water in the mixing vessel;

stirring slowly and at low shear to provide a pre-mix;

15 treating the pre-mix in a magnetic field having a field strength and for a time effective to increase specific gravity of the pre-mix to a specific gravity ranging from 1.015 to 1.018; and

adding the remainder of the water to provide a treated mixture.

27. The method according to claim 26, wherein the magnetic field
20 generation means comprises at least two electrodes provided with wound coils of wire, and at least one D.C. power source sufficient to provide a current at the at least two electrodes ranging from about 20 up to but less than about 40 amperes.

28. The method according to claim 26, further comprising allowing the
25 water to relax prior to heating same; and adding the at least four active ingredients to the water in the mixing vessel slowly, sequentially, and at low shear.

29. The method according to claim 26, further comprising adding at least
one additional constituent to the treated mixture slowly and with mixing at low shear.

30

30. The method according to claim 29, wherein the at least one additional constituent is selected from the group consisting of a thickening agent, a moisturizer, a surfactant, an organoleptically effective ingredient for odor control, a dye, and a fragrance.

5

31. The method according to claim 29, wherein at least two additional constituents are added to the treated mixture and the method further comprises mixing the at least two additional constituents together in a separate vessel prior to adding same to the treated mixture.

10

32. The method according to claim 26, wherein the pre-mix is treated in a magnetic field for a time ranging from about 1 to about 60 minutes.

33. The method according to claim 32, wherein the pre-mix is treated in a magnetic field for a time ranging from about 20 to about 40 minutes.

15

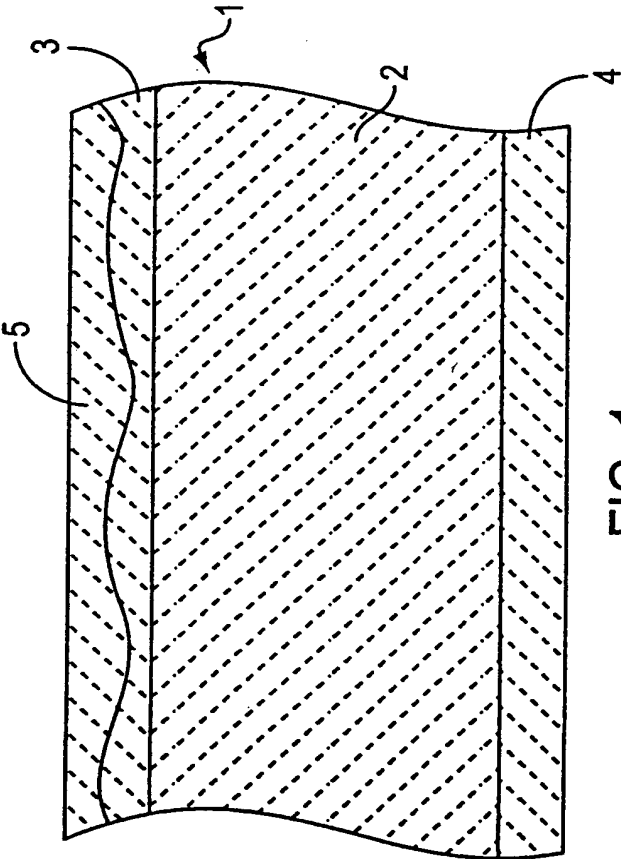


FIG. 1

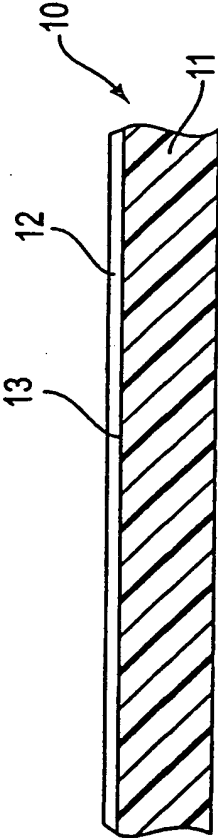


FIG. 2

2/2

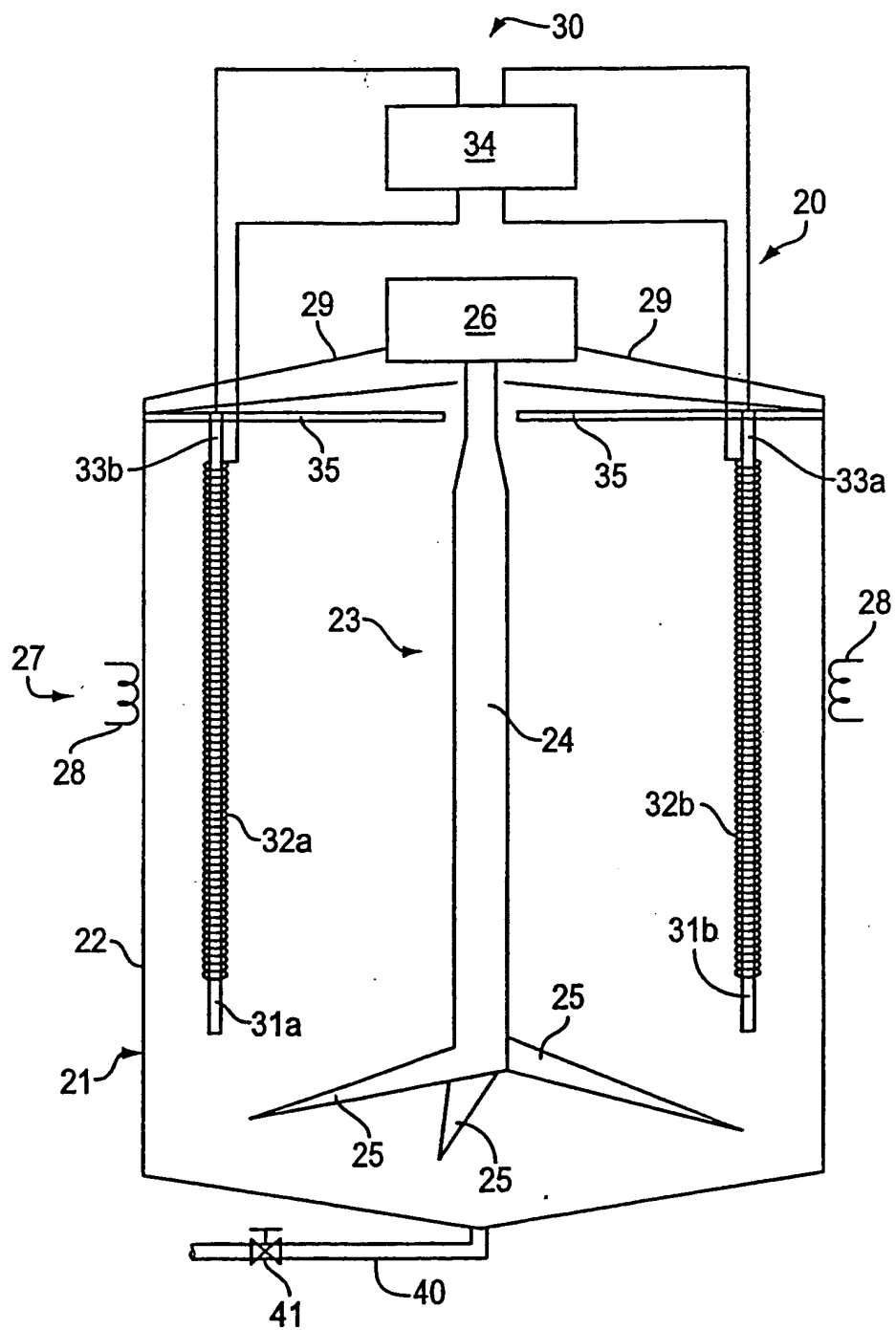


FIG. 3

SUBSTITUTE SHEET (RULE 26)

INTERNATIONAL SEARCH REPORT

International application No.

PCT-US00/11425

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :A01N 25/34; A61K 35/78; B01F 11/00

US CL :424/ 195.1, 404; 366/241

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 424/ 195.1, 404; 366/241

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
MERCK INDEX, 11th edition

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,017,617 A (KIHARA ET AL) 21 May 1991 (21.05.91), see entire document, especially column 3, lines 23-51.	1-33
Y	US 5,420,118 A (ALBAN ET AL) 30 May 1995 (30.05.95), see column 2, lines 44-51 and column 8, lines 10-13.	1-33
Y	US 5,660,833 A (MEDENICA) 26 August 1997 (26.08.97), see column 6, lines 16-21.	1-33
Y	US 4,941,995 A (RICHARDS) 17 July 1990 (17.07.90), see column 2.	1-33
Y	US 5,240,322 A (HABER ET AL) 31 August 1993 (31.08.93), see entire document.	26-33

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

A	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	*T*	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
E	earlier document published on or after the international filing date	*X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
L	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Y*	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
O	document referring to an oral disclosure, use, exhibition or other means	*Z*	document member of the same patent family
P	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

20 JUNE 2000

Date of mailing of the international search report

07 SEP 2000

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/11425

B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

USPT, USPATFULL, REGISTRY, BIOSIS, CAPLUS, EMBASE, MEDLINE

search terms: cetrimonium chloride, benzalkonium chloride, grapefruit, quaternium 12, quaternium 22, cetylpyridinium chloride, disinfectant, antibacterial, antifungal